### (19) World Intellectual Property Organization International Bureau



### 

## (43) International Publication Date 6 May 2005 (06.05.2005)

#### **PCT**

# (10) International Publication Number WO 2005/039679 A1

(51) International Patent Classification<sup>7</sup>: A61H 31/02

A61M 16/00,

(21) International Application Number:

PCT/CA2004/001851

(22) International Filing Date: 21 October 2004 (21.10.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 60/514,449

23 October 2003 (23.10.2003)

- (71) Applicant (for all designated States except US): MA-QUET CRITICAL CARE AB [SE/SE]; Röntgenvägen 2, S-171 95 Solna (SE).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): SINDERBY, Christer [CA/CA]; 40 Humberview Road, Toronto, Ontario M6S 1W6 (CA). BECK, Jennifer [CA/CA]; 40 Humberview

Road, Toronto, Ontario M6S 1W6 (CA). STRÖM, Christer [SE/SE]; Snackstigen 23, S-941 66 Pitea (SE).

- (74) Agents: PRINCE, Gaétan et al.; Brouillette Kosie Prince, 1100 René-Lévesque Blvd., West, 25th Floor, Montréal, Québec H3B 5C9 (CA).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

[Continued on next page]

(54) Title: COMBINED POSITIVE AND NEGATIVE PRESSURE ASSIST VENTILATION

Apply positive pressure assist in order to inflate the lungs

Apply negative pressure assist around the patient's ribcage and/or abdomen in order to reduce the load imposed by the ribcage and/or abdomen on the lungs

Synchronizing the application of positive pressure to the patient's airways and negative pressure to the patient's ribcage

and/or abdomen

(57) Abstract: The present invention relates to a method of delivering combined positive and negative pressure assist ventilation to a patient, wherein a positive pressure is applied to the patient's airways to inflate the patient's lungs, a negative pressure is applied around the patient's ribcage and/or abdomen in order to reduce a load imposed by the ribcage and/or abdomen on the patient's lungs, and application of the positive and negative pressures is synchronized. The present invention also relates to a system for delivering combined positive and negative pressure assist ventilation to a patient, comprising a positive pressure ventilator connected to the patient's airways for applying a positive pressure to the patient's airways to inflate the patient's lungs, a negative pressure ventilator installed on the patient's ribcage and/or abdomen for applying a negative pressure around the patient's ribcage and/or abdomen in order to reduce a load imposed by the ribcage and/or abdomen on the patient's lungs, and a controller for synchronising operation of the positive and negative pressure ventilators.

#### WO 2005/039679 A1

FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,

GW, ML, MR, NE, SN, TD, TG).

before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published: ....

with international search report